

NASA LANGLEY RESEARCH CENTER

**SOFTWARE PROCESS IMPROVEMENT INITIATIVE
IMPLEMENTATION PLAN
(VERSION 1.U)**

Prepared By:
The CornerStone Team Members and
The Software Engineering Process Group

SEPTEMBER 3, 1998

Document Revision Record

Issue Date	Reason for Change	Description of Revision	Sections Affected	Prepared By	Reviewed By	Authorized By
7-16-98	Updated Version from 1.S to 1.T	Updated date and version number	Title page	Schuler	Schuler	MSG
	Added Revision Record to track changes	Added table	Page 2	Schuler	Schuler	MSG
	Added SMSC, MSG, & SEPG Charters to the plan	Added appendix G to house charters and updated text to point the reader to the new appendix	1, 3, App. G			
	Correction to name	Changed Milton H. Holt to H. Milton Holt	1, 2	Schuler	Schuler	MSG
	Updated division acronym	Changed Victoria Chung's division to SRAD	3	Schuler	Schuler	MSG
	Updated SEPG membership	Deleted the names Michael Holloway, RTG/FETD and Sue Voigt, SASPG/SSCD and added Floyd Shipman, RTG/FETD	3, 8	Schuler	Schuler	MSG
9-3-98	Corrected corrupted file	This file got corrupted and the page numbering and some of the formatting was found to be in error after the restoration of the file was complete – a quick attempt was made to correct these – Page numbers are now different and previous revisions pages prior to this date will not be correct as a result	all	Schuler	Schuler	Schuler
	Updated Version from 1.T to 1.U	Updated date and version number	Title page	Schuler	Schuler	MSG
	Updated authorization page	The following was added: (Note: Although the MSG members have been changed, this page has remained unchanged to show the membership at the time of original authorization.)	2	Schuler	Schuler	
	Update charter and MSG membership	Replace the name of David G. Stephens with Jerry N. Hefner and add Doreen Neil	App. G, 1, 8	Schuler	Schuler	MSG
	Update MSG Charter	Add responsibilities for the SEPG lead of posting on web MSG minutes and recording and distributing minutes to the MSG charter and took out references to the ISO process owner	App. G	Schuler	Schuler	MSG

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1. Introduction

The purpose of this plan is to define the Software Process Improvement Initiative Implementation activities for NASA Langley Research Center (LaRC) and to provide management review of those activities.

This SPI Initiative began in August 1997 with the CornerStone Phase to define a High Performance Model and to establish a center-wide baseline of management, development, assurance, and acquisition of software. This High Performance Model (Appendix A) is based on Key Process Areas as defined in the Software Engineering Institute's Capability Maturity Model. The CornerStone team held a series of focused workshops and documented the 'Best Practices' and 'Improvement Opportunities' identified during that phase. A listing of the recommended improvement activities resulting from the CornerStone baselining, is shown in Appendix B.

This plan describes an organization and strategy for implementing improvements under the SPI Initiative for LaRC. During the CornerStone phase specific improvement activities were selected as highest priority for initial implementation (during the first 12-18 months) and these are listed in Appendix C. Each specific improvement effort will be performed by a short term Technical Working Group (TWG) with members from the LaRC organizations willing to invest time and resources to improving a part of their software process. Guidelines for TWG progress reporting are provided in Appendices D and E. A Center-wide Software Engineering Process Group (SEPG) will provide technical advice and coordination of improvement activities with guidance from the Management Steering Group (MSG). The SPI Initiative schedule is provided in Appendix F. Appendix G contains the charters for the Senior Management Steering Committee, the Management Steering Group, and the Software Engineering Process Group.

This plan and the approach described herein have been approved by the sponsors and the MSG (see Section 2).

The Sponsors of the SPI Project:

Fayette S. Collier, Jr.
Patricia L. Dunnington

The members of the MSG:

Robert A. Kudlinski - Lead
Jerry N. Hefner
H. Milton Holt
Leonard R. McMaster
Doreen O. Neil
James R. Rooker
James C. Yu

Senior Management Steering Committee:

P. Douglas Arbuckle
Darrell R. Branscome
Douglas L. Dwoyer
Sammie D. Joplin

2. Authorization to Proceed

Based on a review of this plan, the Sponsors and the Management Steering Group (MSG) authorize the execution of the Implementation Plan for the LaRC Software Process Improvement Initiative. (Note: Although the MSG members have been changed, this page has remained unchanged to show the membership at the time of original authorization.)

Fayette S. Collier, Jr.
ISO 9000 Project Manager

Patricia L. Dunnington
Chief Information Officer

Robert A. Kudlinski
Assistant Chief, ISSD

H. Milton Holt
Chief, FETD

Leonard R. McMaster
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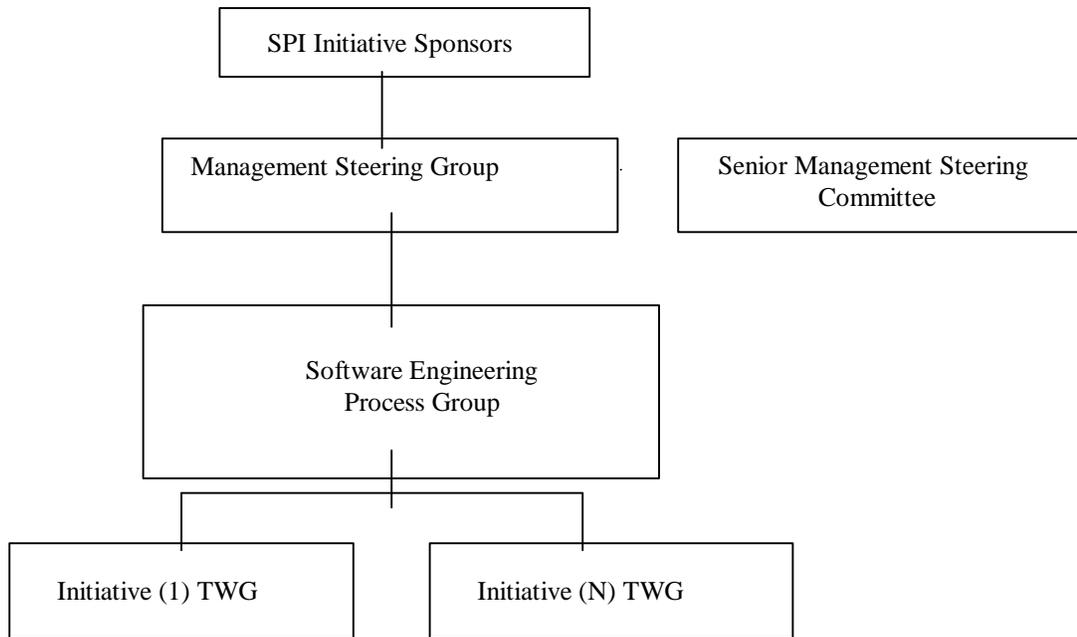
James R. Rooker
Assistant Chief, FSED

David G. Stephens
Chief, FMAD

James C. Yu
Chief, ETTD

3. SPI Initiative Organization

The SPI Initiative organization structure is composed of the SPI Initiative Sponsors, Senior Management Steering Committee, Management Steering Group, SPI Manager, Software Engineering Process Group, and a Technical Working Group (TWG) for each selected improvement activity. The graphic below illustrates their interrelationship. The roles and responsibilities section describes in detail the activities performed by each group and the charters for the SMSC, MSG, and SEPG are contained in appendix G.



The SPI Manager is Pat Schuler (IOG/ISSD). Assisting the SPI Manager on the SEPG are:

Norma Campbell, RTG/FDCD
Victoria Chung, IOG/SRAD
Chuck Niles, IOG/FSED
Jim Townsend, RTG/FMAD

Mike Chapman, IOG/ETTD
Floyd Shipman, RTG/FETD
Pam Rinsland, IOG/AESD
Jim Watson, OSEMA/OMA

4. Software Process Improvement Initiative Goals

4.1 Long-range SPI Initiative Goals

The long-range goals of SPI Initiative are

- 1) To improve the work environment for LaRC's software community, leading to higher morale and increased productivity
- 2) To develop sustainable mechanisms for continuous improvement in the productivity and quality of software developed across LaRC
- 3) To increase customer satisfaction with LaRC software products

A foundation for achieving these long-range goals was laid during the CornerStone Phase of this initiative (See Section 4.2).

4.2 CornerStone Goals

The CornerStone Phase has laid the foundation of LaRC's overall Software Process Improvement Initiative. This phase completes at the signing of this Implementation Plan. The goals of the CornerStone Phase have been

- 1) To develop a plan to improve LaRC's software development practices
 - Identify current state of software development at LaRC (See Software Process Improvement Initiative Findings Presentation delivered to the SPI Initiative Sponsors on Nov. 3, 1997.)
 - Identify current best practices used in software development at LaRC (See the Software Engineering Exchange web page at http://fmad-www.larc.nasa.gov/mdob/users/jctown/SPII/FindingsBrfg_4.html.)
 - Develop a High Performance Model for LaRC's software development activities which incorporates the appropriate elements of the Capability Maturity Model, ISO 9000, Strategic and Quality Framework, and Baldrige Award Criteria (See Appendix C.)
- 2) To obtain management's support, complete with resources, to implement a LaRC Software Process Improvement Plan

5. Organizational Scope

The purpose of the SPI Initiative is to assist those organizations at LaRC that have identified a need to improve their software engineering practices. Thus, the products and processes defined by the SPI Initiative effort will be made available to all managers, developers, assurance and acquisition personnel, and customers of software at LaRC. These products and processes are also intended to assist LaRC in its goal of obtaining ISO certification.

6. Assumptions and Constraints

This Implementation Plan assumes the following approximate time commitments for the SPI Initiative:

- MSG members: 3 hours/month
- SPI Manager: 80 hours/month
- SEPG members: 16 to 40 hours/month
(plus any involvement in coordination of a TWG)
- TWG members: 16 – 32 hours/month for the duration of the TWG
improvement activity (up to 6 months)

Details concerning these time commitments are derived based on the SPI Roles and Responsibilities discussed later in this plan. If the appropriate level of support cannot be obtained for any of the planned SPI improvement activities, the TWG will bring the issue to the attention of the SPI Manager. The SPI Manager will seek assistance from the MSG. If the issues cannot be resolved, the TWG will discontinue the improvement activity until the necessary level of involvement can be obtained.

7. SPI Guidelines

The SPI Initiative activities will be implemented based on the following guidelines. The LaRC SPI Initiative will:

- Be planned and coordinated with the LaRC ISO-9000 Project.
- Review relevant external policies and procedures, when they exist, and make the minimal modifications required for successful LaRC adoption. Where no such definitions exist, LaRC will seek to develop and share the results of our improvement activities.
- Bring together functional experts from multiple project teams to leverage the existing skill base, promote organizational unity, and encourage broad-based support of SPI Initiative work products.
- Seek every opportunity to quantitatively measure our improvements.
- Offer the results of our process improvement activities to all new development efforts and to existing projects as appropriate. The SPI Manager will work with members of the MSG and affected Divisions to determine appropriate application of improvement policies and procedures.

8. Roles and Responsibilities

The following chart describes the positions, staffing, and responsibilities for Software Process Improvement Initiative members:

POSITION	INITIALLY FILLED BY	RESPONSIBILITIES
Senior Management Steering Committee	Douglas Arbuckle Sammie Joplin Douglas Dwoyer Darrell Branscome	<ul style="list-style-type: none"> ➤ Secure management support and active participation in the SPI Initiative from Group Directors and Program Offices ➤ Demonstrate senior management commitment to software process improvement
Software Process Improvement (SPI) Initiative Sponsors	Fayette Collier Pat Dunnington	<ul style="list-style-type: none"> ➤ Secure management support and active participation in the SPI Initiative from Division Chiefs and Program Managers ➤ Assure alignment and provide direction under the ISO-9000 Project ➤ Demonstrate senior management commitment to software process improvement
Management Steering Group (MSG) Lead	Rob Kudlinski	<ul style="list-style-type: none"> ➤ Leads MSG ➤ Schedules and chairs monthly MSG status meetings ➤ Records and tracks MSG action items ➤ Solicits support and active participation in the SPI Initiative ➤ Assures minutes of each meeting are published (possibly on the web)
Management Steering Group (MSG)	Jerry Hefner Milt Holt Randy Rooker Lenny McMaster Doreen O. Neil Jim Yu	<ul style="list-style-type: none"> ➤ Approve Implementation Plan for SPI and significant changes ➤ Ensure alignment of SPI improvement activities with LaRC mission and goals ➤ Provide advocacy, pro-active commitment, and visible management support ➤ Allocate resources ➤ Monitor the progress of the SPI Initiative ➤ Provide guidance and direction to the SEPG ➤ Conduct periodic meetings with the SEPG to review the SPI Initiative and discuss concerns ➤ Promote cooperation and cross-functional communications ➤ Obtain and sustain LaRC support for the SPI Initiative ➤ Assist SEPG in risk mitigation for SPI Initiative ➤ Identify and solicit applicable organizations for adoption of results from successful pilots, and approve SEPG support and resources for those adoption activities
Software Process Improvement Manager	Pat Schuler	<ul style="list-style-type: none"> ➤ Coordinates the day-to-day SEPG activities ➤ Acts as liaison between MSG and SEPG and reports monthly on SPI Initiative status, risks and accomplishments ➤ Ensures alignment with ISO-9000 Project ➤ Advises MSG of potential risks and recommended mitigation actions ➤ Leverages SEPG experiences and lessons learned across LaRC ➤ Manages allocation of resources to TWGs ➤ Tracks the number of projects implementing each improvement

POSITION	INITIALLY FILLED BY	RESPONSIBILITIES
Software Engineering Process Group (SEPG)	Pam Rinsland, Victoria Chung, Chuck Niles, Jim Townsend, Floyd Shipman, Norma Campbell, Mike Chapman, Jim Watson,	<ul style="list-style-type: none"> ➤ Define and manage the plan for development and implementation of software process improvements across LaRC ➤ Build and reinforce management support for the SPI Initiative ➤ Provide a resource pool for software engineering expertise and corporate knowledge ➤ Provide consultation and guidance on appropriate level of software engineering implementation and future directions ➤ Provide and facilitate education on software engineering to management and staff via workshops, seminars, symposia; set up news/user groups; and maintain web site ➤ Provide a repository for reuse code, documents, tool recommendations, procedures, processes, LaRC best practices, templates, lessons learned, metrics, and examples ➤ Facilitate sharing of tools and COTS maintenance costs across projects ➤ Estimate TWG resources needed for improvement activities and recommend TWG members ➤ Designate a SEPG member to guide each improvement activity as described in the SPI Initiative Implementation Approach (Section 9.2) and to facilitate the TWG meetings ➤ Monitor progress and review periodic TWG reports from designated SEPG member ➤ Review schedule and deliverables of the TWGs ➤ Approve the pilot project for each TWG ➤ Develop, coordinate, and integrate SEPG and TWG developed artifacts into a <i>LaRC Software Project Implementation Handbook</i> ➤ Solicit and incorporate feedback on overall SPI Initiative and document lessons learned
Technical Working Group	To be determined for each separate activity.	<ul style="list-style-type: none"> ➤ For a specified activity listed in Appendix C define an implementation plan and pilot project following the SPI Initiative Implementation Approach (Section 9.2).

9. SPI Initiative Implementation Approach

SPI Initiative will be implemented in the following two phases:

Phase 1: (Section 9.1) Initial Process Definition for the *LaRC Software Project Implementation Handbook*. This handbook will define the software development process for the center and will link into the LaRC ISO-9000 Project Process Framework. It will define **WHAT** is required on all software projects at the center. It will also cover when, where and by whom the process activities will be done.

Phase 2: (Section 9.2) Guidance for and Improvements to the *LaRC Software Project Implementation Handbook*. Guidance will be documented on **HOW** to implement the process defined in the *LaRC Software Project Implementation Handbook* and software engineering process improvements will be implemented at the center.

There are three customer groups of the process and their expectations are documented below.

- a) Expectations of those individuals involved in the production of software at LaRC:
1. The process documentation shall define what is required for specific type and size classes of software development.
 2. The type and size classes of software development shall be defined in the process documentation.
 3. The purpose and added value of each process and product shall be defined in the process documentation.
 4. The process shall not specify how to perform a process element.
 5. The process shall only provide suggested "how to" guidance and not require a reader to use a specific methodology.
 6. The process documentation shall be developed using MicroSoft Word for Windows Version 7.0a as the word processor.
 7. All acronyms and abbreviations used in the process documentation shall be defined.
 8. The first time an acronym is mentioned in a process element it shall be spelled out (to minimize cross referencing).
 9. A trace matrix shall be included in the process documentation which maps the process elements to the corresponding requirements which they fulfill. The requirements shall include the Key Process Areas Defined in the High Performance Model and the customer expectations defined in this document.
 10. The process documentation should be as small as possible.
 11. The process documentation should make as few as possible references to required text. All the required process activities, procedures, and templates should be in line to the text.
 12. References should be reserved for referencing guidance text only.
 13. Each process should have entrance and exit criteria.
 14. The readers should always know where they are in the process; exactly which box on the process flow they are performing.
 15. Whenever possible, the process documentation should point to LaRC existing best practices. (Example: existing C++ coding standards that are used by some LaRC staff.)
 16. The process documentation should be on the web and accessible to all LaRC employees and support contractors with web browsers.
- b) Expectations of the recipients of LaRC software products:
1. The developer shall understand and meet the requirements.
 2. The developer shall deliver the products on time according to an agreed upon schedule.

3. The developer shall deliver the products within the agreed upon budget.
4. The developer shall test all products prior to delivery to assure high products quality.
5. The developer should design software to be modifiable.
6. The developer should produce the minimum product to meet the requirements.

c) The ISO-9000 Project Office

1. The process shall be captured using flow charts, interface definitions, roles and responsibilities, and supporting documentation.
2. The software process shall address sub-supplier, supplier relationships; including relationships with contractors. (The Intergroup Coordination and Software Subcontract Management Key Process Areas shall be heavily utilized in documenting those relationships.)
3. The top level of the process flow charts will have no more than six major process elements. Each process element can be decomposed into lower level elements.
4. The process should fit within a 1 inch thick notebook and preferably not fill the whole notebook.

The above expectations along with the High Performance Model, defined in Appendix A, provides the primary requirements which the process will be designed to meet. A complete requirements and design will be developed once this plan is approved.

The following documents will be reviewed for inclusion or reference in the process documentation:

- DERA, Business Management System, Air Systems Sector, Software Procedures
- DERA, Business Management System, Air Systems Sector, Software Guides
- Software Engineering Standards (Red Book), C Mazza et al, Prentice Hall (1994), ISBN 0-13-106568-8
- Software Engineering Guides (Blue Book), C Mazza et al, Prentice Hall (1996), ISBN 0-13-449281-1
- Software Engineering Process Guidebook, (1997)
- LHB 5300.4: Software Assurance Handbook
- NPD 2820: NASA Software Policies
- NPG 7120.5: NASA Program and Project Management Processes and Requirements

9.1 Initial Process Definition for the *LaRC Software Project Implementation Handbook*

A process for software project implementation will be developed which will specify **WHAT** are the minimum activities that shall be required on software development projects at LaRC. It will also cover when, where and by whom the process activities will be done. The process requirements will be tailorable to size and type of project. Developing guidance on **HOW** to perform process activities will be done under Section 9.2 of this plan.

The SEPG will finalizes the requirements for the process and develop a design of the process. The design of the process will define the organization of the types and levels of supporting documentation. The SEPG will then define the process flow charts, interfaces, roles and responsibilities, and supporting documentation to specify what is required under the process. Supporting documentation can be reused from existing artifacts, or developed. Existing documents will be reviewed specifically to identify reuse opportunities. The SEPG, the MSG, and the ISO Project Office representatives will review the defined process.

The documentation of high level management processes that are not specific to software will be defined by a team appointed by the ISO Project Office. The high level management processes will be reviewed by the SEPG to determine what, if any, additional management processes should be documented to assure complete coverage of all processes necessary to manage software projects. In addition, the interfaces between the high level management processes and the software management processes will be reviewed and discrepancies will be resolved.

9.2 Guidance for and Improvements to the *LaRC Software Project Implementation Handbook*

The SEPG will document suggested guidance on HOW to perform the process defined in the *LaRC Software Project Implementation Handbook* (Section 9.1). Supporting guidance documentation may be reused from existing artifacts or developed using the generic approach provided in the table below. Existing documents will be reviewed specifically to identify reuse opportunities. The SEPG, the MSG, and the ISO Project Office representatives will review the guidance documentation.

The potential improvement activities identified from the CornerStone baselining activity are contained in Appendix B. The activities selected for implementation by the CornerStone Team and the SEPG are defined in Appendix C. These activities will be implemented in accordance with the SPI Initiative Implementation schedule and will be used to realize the High Performance Model and customer expectations (Section 9) for software development, assurance, and acquisition at LaRC.

The SPI Initiative will incrementally introduce improvement activities at a pace that is consistent with the level of SPI resources available. A TWG will be formed to implement each of the improvement activities. The generic approach to each activity can be broken down into the following stages; the group primarily responsible is identified.

Group Responsible	Activities
	Prepare
SEPG	Identify and document linkage to LaRC ISO-9000 Project Process Framework
SEPG	Select and approve TWG members
SEPG	Train TWG on SPI Initiative, CornerStone, LaRC ISO-9000 Project Process Framework linkage and TWG process
TWG	Evaluate existing artifacts (policies, processes, best practices, lessons learned, related CornerStone Findings, “how to’s”)
TWG	Develop technical approach, schedule, cost estimates and deliverables list
TWG, SEPG	Identify resources (expertise, tools, funding) available to TWG
TWG	Document the process (include policy, procedures, templates, guidelines, and metrics, as applicable)
TWG	Establish training requirements and develop training curriculum where appropriate
TWG, SEPG, Pilot Staff	Select the pilot project and obtain commitment
	Pilot
TWG, Pilot Staff	Tailor process for selected project; develop schedules
TWG, Pilot Staff	Obtain baseline metrics

TWG	Train project staff
TWG, Pilot Staff	Implement improvement
TWG, Pilot Staff	Obtain and incorporate feedback on improvement; document lessons learned
TWG, Pilot Staff	Document pilot performance (artifacts, URL, actual costs, estimated Return On Investment (ROI), including organization's estimated ROI, and expectations...)
TWG, SEPG	Publicize pilot results and LaRC ISO-9000 Project Process Framework element fulfillment
TWG	Recommend revisions to generalized approach for use across LaRC
	Deployment
TWG, SEPG	Revise each improvement process for general use, including policy, procedures, templates, guidelines, and metrics where applicable
MSG, SEPG	Identify and solicit applicable organizations for adoption of results from successful pilots and approve SEPG support and resources for those adoption activities
Each Adopting Organization, SEPG	Define, document and approve implementation plan for deployment of improvements within the organization
SEPG	Conduct training/mentoring and consult on implementation including assistance in tailoring
SEPG	Obtain and incorporate feedback on process, document lessons learned

10. SPI Initiative Implementation Schedule

A draft SPI Initiative schedule is contained in Appendix F. A detailed schedule will be produced by each Technical Working Group for its improvement activity, reviewed with the SEPG, and approved by the MSG. The schedules will be updated as needed.

11. SPI Initiative Status Reports and Reviews

The Software Process Improvement Manager will define in a spread sheet all of the major processes defined in the *LaRC Software Project Implementation Handbook*. Each major sub-process will have the following schedule elements tracked on a periodic basis: 1) development and documentation of the process, 2) development and documentation of supporting text, 3) concurrence and approval from SEPG and MSG, 4) ISO-9000 alignment, 5) ISO-9000 Project Office review. The actual start and finish date of each of these schedule elements will be documented and tracked to determine if process definition and documentation is progressing at a reasonable pace.

The Software Engineering Process Group will meet monthly to review action items and status of all Technical Working Groups. Appendix D contains the format for reporting TWG status to the SEPG. The SPI Manager will brief the MSG on SPI Initiative efforts at the regular MSG monthly meetings. The MSG lead is responsible for tracking all MSG related action items.

At the conclusion of each TWG improvement activity, the TWG will provide a written report following the format contained in Appendix E. All reports will be made available on the LaRC Software Engineering Exchange web site. Where appropriate, the TWG will conduct a briefing on the results, open to all LaRC personnel.

On a semi-annual basis, the SEPG and MSG will combine their monthly meetings and conduct a review of the SPI Initiative. The review will cover overall initiative direction and progress including metrics, return-on-investment, level of effort, concerns, customer feedback, and future direction.

12. Measurement and Tracking

SPI Initiative progress will be tracked by entering actuals against estimates in the SPI schedule. Each TWG will track actual progress against the TWG schedule developed for its improvement activity. The sum of all TWG schedules plus the additional MSG and SEPG activities will be included in the LaRC SPI Initiative schedule.

Each TWG improvement activity will be mapped to appropriate elements of the LaRC ISO-9000 Project Process Framework. Upon completion of each activity, fulfillment of the framework elements, as they relate to software, will be evaluated and documented.

The SPI Manager will track the number of projects implementing each improvement activity. MSG support will be required to track this measurement.

Each TWG will document customer expectation for improvement, evaluate and document pilot performance, and where appropriate, estimate the return-on-investment in the pilot.

SEPG will evaluate the adequacy of the improvement in meeting customers' expectations.

TWGs will provide feedback on the SPI Initiative Implementation Approach (Section 9.2) to facilitate process improvement under this plan.

13. Change Management

The procedures for reviewing, approving and changing the SPI Initiative Implementation Plan are as follows:

- Reviewing the Implementation Plan – The SEPG will develop the Plan, review the Plan and incorporate any required changes.
- Approving the Implementation Plan – The SEPG will present the SPI Initiative Implementation Plan to the MSG for review. When the plan meets their approval, the MSG will sign the Authorization to Proceed section which will officially initiate the plan activities.
- Changing the Plan – In the event that changes to the Plan are required, the SEPG will submit the requested changes to the MSG for review and approval. On a semi-annual basis the Plan will be reviewed and updated during the joint meeting of the MSG and SEPG. However, the plan schedule will be updated as needed.

14. Risk Management

After membership in the SEPG has been finalized, a plan for conducting risk management continuously throughout the SPI Initiative will be developed and documented as an appendix to this Implementation Plan. This Risk Management Plan will be tracked on a regular basis.

Appendix A - High Performance Model

The following ten Key Process Areas defined in the Software Engineering Institutes Capability Maturity Model have been reviewed and selected by the CornerStone team as the software critical processes for achieving a High Performance Organization:

Requirements Management (CMM Level 2)

The purpose of Requirements Management is to establish and maintain an agreement with the customer on the requirements for the software project.

Software Project Planning (CMM Level 2)

Software Project Planning involves developing estimates for the work to be performed, establishing the necessary commitments, and defining the plan to perform the work.

Software Project Tracking & Oversight (CMM Level 2)

Software Project Tracking and Oversight involves tracking and reviewing the software accomplishments and results against documented estimates, commitments, and plans and adjusting those plans based on the actual accomplishments and results.

Software Subcontract Management (CMM Level 2)

Software Subcontract Management involves selecting a software subcontractor, establishing commitments with the subcontractor, and tracking and reviewing the subcontractor's performance and results. (Note: NASA can be thought of as the contractor in this situation and LaRC support contractors such as CSC and TRW are considered subcontractors.)

Software Configuration Management (CMM Level 2)

Software Configuration Management involves identifying configuration items for the software project, controlling these configuration items and changes to them, and recording and reporting status and change activity for these configuration items.

Software Quality Assurance (CMM Level 2)

Software Quality Assurance involves reviewing and auditing the software products and activities to verify that they comply with the applicable procedures and providing the software project with the results of these reviews and audits.

Software Product Engineering (CMM Level 3)

Software Product Engineering involves performing the engineering tasks to build and maintain the software using the defined software process and appropriate methods and tools. [Note: the definition of this Key Process Area has been expanded to include the activities performed under the maintenance phase.]

Intergroup Coordination (CMM Level 3)

Intergroup Coordination involves the software engineering group's participation with other project engineering groups to address system-level requirements, objectives, and issues.

Peer Reviews (CMM Level 3)

Peer Reviews involve a methodical examination of software work products by the producers' peers (at LaRC) to identify defects and areas where changes are needed.

Training Program (CMM Level 3)

Training Program involves first identifying the training needed by the organization, projects, and individuals, then developing or procuring training to address the identified needs.

Appendix B - Potential SPI Improvement Activities

Based on the findings from the CornerStone workshops and LaRC management recommendations, the Key Process Areas in Appendix A were prioritized. The following potential improvement activities were then defined based on that prioritization.

Column one (labeled #) provides a unique identifier for each potential improvement activity. Column two below (labeled *) provides the traceability to the selected improvement activities in Appendix C.

#	*	Improvement Activity
		Requirements Management
B1	C1	Training in Requirements Generation <ul style="list-style-type: none"> • Why and how to perform requirements management • Include an Operations Concept in the Requirements Document • Training should be provided for both the Customer and Developer • Improve on early involvement of software engineers • Include Systems Analysis • Innovative Requirements Management techniques (JAD, PPMI, OORA)
B2	C1	Determine how to Manage Requirements Document, prioritize, and keep them up to date
B3	C1	Review NASA/LaRC Existing Policies on Requirements Management for adequacy
		Software Project Management (combination of Software Project Planning and Software Project Tracking and Oversight Key Process Areas)
B4	C3	Review existing NASA/LaRC Software Management Policies and Guidelines (including those from the Software Engineering Lab at GSFC) for adequacy Ensure software is included in project's WBS and overall project organization
B5	C3	Training in Software Project Planning, Estimating and Tracking
B6	C3	Establish project management metrics
B7	C3	Develop software cost capture process
B8	C3	(The following activities are RTOP funded.) <ul style="list-style-type: none"> • Pilot existing Risk Management Process • Using NASA Continuous Risk Management Course and the SEI's guidebook
B9	-	Capture and communicate Lessons Learned from past projects
B10	C3	Determine how to document, maintain, and track project plans Develop a one day short course on general project management
B11	C3	Determine how to conduct effective Project and Software Project Reviews <ul style="list-style-type: none"> • Review for appropriate inclusion of software Operational Readiness Review (ORR) and Test Readiness Review (TRR)
		Software Configuration Management
B12	C2	Define Effective Guidelines for SCM (including CM in the maintenance phase) <ul style="list-style-type: none"> • When to implement SCM • How to tailor SCM base on project size and type • Communicating status of changes and configuration • Review existing guidelines • Creating and tracking baselines • Documenting SCM approach (SCM plans, audits, Version Description Documents...)

B13	C2	Identify Applicable SCM Tools <ul style="list-style-type: none"> • Identify existing tools and methods currently in use at LaRC • Publicize Best Practices • Investigate site licenses for tools
B14	C2	Training on SCM and Associated Guidelines
B15	C2	Pilots for Existing SCM Procedures: <ul style="list-style-type: none"> • FIDO pilot • Wind Tunnel pilot
		Software Subcontractor Management
B16	C4	Determine how to make Effective Use of Performance Based Contracting <ul style="list-style-type: none"> • Accountability for performance • Technical communication
B17	-	Training for COTRs and Technical Monitors for Software Projects <ul style="list-style-type: none"> • Writing Performance Work Statements (adequate contractor training should be covered) • Including a deliverables list in work statement • Measuring and assessing performance • Tracking progress • Effective feedback/reviews
B18	-	Define Guidelines for Software in Source Evaluation Boards <ul style="list-style-type: none"> • Writing RFPs (include contractors training) • Address contractor turnover • Include Data Requirements List (DRL) and Data Requirements Deliverables (DRD) • Select on best value, not lowest bidder • Evaluate bidder's ability to perform work (CMM/ISO)
		Intergroup Coordination
B19	-	Develop Guidelines for Effective Software Project Communication with Project Management Documented commitments between engineering groups
B20	-	Evaluate PPMI Project Management Training to Ensure Adequate Coverage of Software Related Issues <p style="text-align: center;">Consider developing a short course specifically on software (invite previous graduates of Project Management Training)</p> <p style="text-align: center;">The course should teach that representatives from all disciplines, including software, should be included early in the project life-cycle</p>
B21	-	Develop effective systems engineering guidelines and involve the Systems Engineering Improvement Team
B22	-	Promoting Inter-project Communications <p style="text-align: center;">Share experiences and lessons learned (workshops, seminars, Web site...)</p>

Appendix C - Selected SPI Improvement Activities

The following improvement activities will be implemented to aid LaRC in achieving the High Performance Model for software development, assurance, and acquisition. The CornerStone Team and the SEPG selected these activities from Appendix B based on return on investment, schedule length, alignment with ISO, resource requirements, broad applicability, likelihood of success, suitability for pilot demonstration, and on the logical order of implementation. Column one (labeled #) provides a unique identifier for each selected improvement activity.

#	Traceability to Appendix B	Improvement Activities
C1	B1, B2, B3	<p>Requirements Management</p> <p>Evaluate existing artifacts (policies, processes (including the Requirements related processes contained in the Software Engineering Process Guidebook developed at LaRC), best practices, lessons learned, related CornerStone Findings, “how to’s”).</p> <p>Develop technical approach, schedule, estimated costs, and deliverables list for this improvement activity.</p> <p>Document the process or refine existing process (for generating and managing requirements for software), include where applicable policy, procedures, templates, guidelines, metrics. Include Requirements Generation (including Operations Concept), why and how to perform requirements management (document, prioritize, and keep current), early involvement of all engineering disciplines including software engineers, and interconnection with systems analysis. Investigate innovative requirements definition and management methods and techniques. (JAD, PPMI, OORA) Target audience should be both the Customer and Developer.</p> <p>Establish training requirements for both the Customer and Developer and develop training curriculum if needed (make or buy recommendation). Coordinate all training efforts with the NASA Software Working Group – Training Subgroup.</p> <p>Select the pilot project(s).</p> <p>Train Pilot project personnel.</p> <p>Evaluate effectiveness of process and training.</p>
C2	B12, B13, B14, B15	<p>Software Configuration Management</p> <p>Note: This improvement activity covers both the development and the maintenance phase.</p>

		<p>Review existing process (included in the Software Engineering Process Guidebook developed at LaRC) and evaluate existing artifacts (policies, processes, best practices, lessons learned, related CornerStone Findings, “how to’s”).</p> <p>Develop technical approach, schedule, estimated costs, and deliverables list for this improvement activity.</p> <p>Define guidelines for: metrics to collect, what point in the process life-cycle to implement CM and to what level of rigor; how to tailor CM process based on the project size and type; communicating status of changes; creating and tracking baselines.</p> <p>Identify applicable SCM tools at LaRC and investigate site licenses to increase tool availability.</p> <p>Tailor current processes (included in the Software Engineering Process Guidebook developed at LaRC) to the specified pilot project, train pilot project personnel on process tailored for their project, and aid in initial implementation. (This activity is RTOP funded for a specific project)</p> <p>Establish training requirements and develop training curriculum if needed (make or buy recommendation). Coordinate all training efforts with the NASA Software Working Group – Training Subgroup.</p> <p>Evaluate effectiveness of process and training and make recommendations to improve them based on initial use of training and the feedback from the pilot.</p>
C3	B4, B5, B6, B7, B8, B10, B11	Software Project Management (combination of Software Project Planning and Software Project Tracking and Oversight Key Process Areas)
		Evaluate existing artifacts (policies, processes, best practices, lessons learned, related CornerStone Findings, NASA Metric Database, Software Engineering Process Guidebook developed at LaRC, GSFC/SEL Guides, “how to’s”).
		<p>Develop technical approach, schedule, estimated costs, and deliverables list for this improvement activity.</p> <p>Document the process, include where applicable policy, procedures, templates, guidelines, metrics.</p> <ul style="list-style-type: none"> • Include software project planning, estimating, tracking and controlling, and cost capture. • Include how to document, maintain, and track project plans. • Include how to conduct effective project and software project reviews. (Review for inclusion, where appropriate, the use of Operational Readiness Review (ORR) and Test Readiness Review (TRR).) <p>Note: Risk Management process is already covered in the SEI ‘Continuous Risk Management Guidebook’ and NASA course.</p>

		<p>Establish training requirements and develop training curriculum where appropriate (make or buy recommendation). Coordinate all training efforts with the NASA Software Working Group – Training Subgroup.</p> <ul style="list-style-type: none"> • Develop or obtain a one day short course on general project management. (Investigate reusing current PPMI course materials.) • Develop or obtain follow on detailed software project training. (Investigate reusing current PPMI course materials.) This course should cover the same topics defined in the process specified above. <p>Note: Risk Management training is already covered in the NASA Continuous Risk Management Course.</p> <p>Select the project management pilot project(s).</p> <p>Train pilot project personnel on project management.</p> <p>Evaluate effectiveness of process and training.</p> <ul style="list-style-type: none"> • Train pilot project personnel using the NASA Continuous Risk Management Course. • Pilot 1: Life Cycle Analysis Capability Project • Pilot 2: LaRC SEPG • Tailor current Continuous Risk Management process to each individual pilot project. <p>Evaluate effectiveness of process and training. (This activity is RTOP funded and is specifically for Risk Management Pilots)</p>
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C4	B16	Software Subcontractor Management
		<p>Determine how to make effective use of Performance Based Contracting on software projects.</p> <ul style="list-style-type: none"> • Evaluate existing artifacts (policies, processes, best practices, lessons learned, related CornerStone Findings, “how to’s”). • Develop technical approach, schedule, estimated costs, and deliverables list for this improvement activity. • Record and catalogue supporting documentation (process, policy, procedures, templates, guidelines, and metrics where appropriate). • Include the coverage of issues on accountability for performance and technical communication. <p>Establish training requirements and develop training curriculum where appropriate (make or buy recommendation). Coordinate all training efforts with the NASA Software Working Group – Training Subgroup.</p> <p>Select the pilot project(s).</p> <p>Train pilot project personnel.</p> <p>Evaluate effectiveness of process and training.</p>

Appendix D - Format for Technical Working Group (TWG) Monthly Progress Report

This report will be generated by each TWG and provided to the SPI Manager prior to the monthly SEPG review.

Title (name of improvement activity / date of report):

Hours expended since last report:

Summary of activities completed since last report:

This section provides the status based on monitoring this improvement activity against its plan.

Report on how the plan implementation is affecting the pilot's staff and achievement of customer expectations.

Problems / Risks and proposed solutions/mitigations:

Provide a list of existing problems or risks and suggested corrective action or mitigation strategy.

Deliverables completed to date:

Future deliverables:

Original Estimated Start date:

Provide rationale for discrepancies in dates.

Actual Start Date:

Original estimated completion date :

Provide rationale for discrepancies in dates.

Current estimated completion

Completion Date:

Summary of planned activities for next report period:

Attach TWG updated schedule.

Appendix E - Format for Technical Working Group (TWG) Final Report

This report will be generated by each TWG and provided to the SPI Manager prior to the Semi-annual SPI Initiative Review with the Management Steering Group and the Software Engineering Process Group and at the completion of the TWG improvement activity.

Name of improvement activity:

Date of report:

Description of improvement activity:

LaRC ISO-9000 Project Process Framework element(s) fulfillment:

TWG members:

Artifacts evaluated at start of improvement activity:

Estimated and Actual schedule, cost, and resources (by milestone):

Technical approach:

Deliverables list and archive location:

Pilot Project (n) Title:

Technologies transferred:

Pilot project's domain and project description:

Baseline metrics:

Pilot project/organization expectations:

Description on technology transfer activities performed (including WBS, staff hours expended per WBS element, estimated and actual dates for completed milestones):

Artifact list and archive location:

Feedback on improvements implemented (including lessons learned and recommended or proposed changes to executed process, procedures, training, etc.):

Feedback on the SPI activity Implementation Approach:

Estimated Return On Investment:

Pilot project/organization feedback on achievement of pilot expectations:

Appendix F - SPI Initiative Implementation Plan Schedule

This appendix contains draft schedule estimates for the implementation of improvement activities defined in Appendix C, as well as specific SEPG, and MSG activities.

(Note: The duration column refers to calendar time.)

#	SEPG Activities	Duration	Status
1	Develop and revise MSG and SEPG Charters	4 weeks	
2	Write CornerStone Final Report	4 weeks	Started 2/98
3	Attend Risk Management Course Develop Risk Management Plan for the SPI Initiative	3 weeks	4/15/95
4	Review applicability of DERA's approach		Started 1/98
5	Establish and populate LaRC's SPI Web Site	16 weeks	Started 2/98 Estimated Completion 6/98
6	Complete SEPG membership drive and finalize membership	2 weeks	
7	Review recommended SEPG activities (requested in workshops), prioritize, and determine appropriate implementation strategy	4 weeks	
8	Brief Division Chiefs and Group Leaders on CornerStone findings	TBD	Started 11/97
9	Meet monthly to review SPI activities	4 hrs/month	
10	Prepare training curriculum for TWG orientation	2 weeks	
11	Perform SEPG responsibilities defined in Section 8	Ongoing	
12	Initial process definition for the <i>LaRC Software Project Implementation Handbook</i>	6 months	Start 3/98
13	Guidance for the process defined in the <i>LaRC Software Project Implementation Handbook</i>	6 months	Start 3/98

#	MSG Activities	Duration	Status
1	Review and approve SPI Initiative Implementation Plan	4 weeks	
2	Solicit support and active participation in the SPI Initiative from LaRC Program Managers	On going	
3	Assure representation on the ISO Process Definition Team (i.e. Rob Kudlinski, MSG Lead)	ASAP	
4	Review and approve MSG and SEPG charters	4 weeks	
5	Meet monthly to review SPI and MSG activities	4 hrs/month	

6	<p>Review management related ‘Improvement Opportunities’ and ‘Related Concerns’ from the Findings Briefing and determine appropriate improvement activities.</p> <p>Example areas for Improvement :</p> <ul style="list-style-type: none"> • Lack of a reward structure for good software engineering practices • Externally driven schedule deadlines (as opposed to requirements and resource driven) • Lack of an effective systems engineering function • Project line of authority not clearly defined across organizational boundaries • Ineffective Intergroup Coordination <ul style="list-style-type: none"> • Ineffective appreciation for teamwork within a projects, results in poor communication, moral, and rework • Poor Communication across projects, results in redundant work/duplication of effort 	TBD for each improvement opportunity	
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Scheduling options for improvement activities

- 1) Start a new improvement activity in a phased manner every 6 weeks (Low Risk)
- 2) If ISO requires quicker turnaround, initiate improvement activities in parallel with increased staff level of effort (Moderate Risk)

(Note: Column one (labeled #) provides the unique identifier for each improvement activity documented in Appendix C.)

#	Improvement Activity	Duration	Status
C1	Requirements Management		
	Prepare		
	Select, approve, and train TWG members	2 weeks	
	Evaluate existing artifacts, develop approach & schedule, and ID resources	2 weeks	
	Document process, establish training, select pilot	TBD by TWG	
	Pilot		
	Perform detailed activities involved in pilot implementation	6-8 weeks	
	Deploy		
	Revise process for general use	2 weeks	
	Deploy improvement activities in adopting organizations	TBD by SEPG	
C2	Software Configuration Management		
	Prepare		
	Identify and establish pilot project, select process, and obtain resources (RTOP) for implementation. Cost will be split equally between the pilot project and the RTOP support funds.	4 weeks	Completed Q1, FY98
	Pilot		
	Perform FIDO pilot implementation of the CM process defined in the Software Engineering Process Guidebook developed at LaRC. NAS1-20431, TSN43A, HSPC 4.0 Software Configuration Management task specifies the implementation details for the pilot implementation of CM	6 to 9 months	Started (1/5/98)

	processes.		
	Deploy		
	Expand, approve, and train TWG	2 weeks	
	Evaluate existing artifacts including pilot lessons learned and Sim-to-Flight CM best practices, determine if additional work is need in CM	2 weeks	
	Revise process for general use, make pilot artifacts anonymous, and post on web	TBD by TWG	
	Deploy improvement activities in adopting organizations	TBD by SEPG	
C3	Software Project Management		
	Prepare		
	Select, approve, and train TWG members	2 weeks	
	Evaluate existing artifacts, develop approach & schedule, and ID resources	2 weeks	
	Document process, establish training, select pilot	TBD by TWG	
	Pilot		
	Perform Life Cycle Analysis Capability Project and SEPG pilot implementations of the Continuous Risk Management Process as defined in the associated NASA course and SEI guidebook. Training and contract support is RTOP funded.		Start date (4/15/98)
	Perform detailed activities involved in pilot implementation	6-8 weeks	
	Deploy		
	Revise process for general use	2 weeks	
	Deploy improvement activities in adopting organizations	TBD by SEPG	
C4	Software Subcontractor Management		
	Prepare		
	Select, approve, and train TWG members	2 weeks	
	Evaluate existing artifacts, develop approach & schedule, and ID resources	2 weeks	
	Document process, establish training, select pilot	TBD by TWG	
	Pilot		
	Perform detailed activities involved in pilot implementation	6-8 weeks	
	Deploy		
	Revise process for general use	2 weeks	
	Deploy improvement activities in adopting organizations	TBD by SEPG	

Appendix G – Charters

Senior Management Steering Committee Charter (SMSC)

Purpose

This Charter establishes the Senior Management Steering Committee (SMSC) for the LaRC Software Process Improvement (SPI) Initiative.

The purpose of the SMSC is to support the long-range process improvement activities of the center by facilitating interaction among the organizations, promoting participation and information-sharing, and providing a mechanism for the Software Process Improvement Initiative to address common organizational problems.

Scope

The SMSC is made up of a LaRC senior management staff who work together to address the software process improvement interests of the entire center. The SMSC will exist for the duration of the SPI Initiative.

Mission

To support the operation of the LaRC Software Process Improvement Initiative and the execution of the approved implementation plan.

Management Steering Group Responsibilities

- Secure management support and active participation in the SPI Initiative from Group Directors and Program Offices
- Demonstrate senior management commitment to software process improvement

Membership

Associate Center Director (P. Douglas Arbuckle)
Director, SASPG (Darrell R. Branscome)
Director, RTG (Douglas L. Dwoyer)
Director, IOG (Sammie D. Joplin)

Conduct of Operations

- The SMSC meets every six months.
- The meetings are mandatory for all SMSC members. Designees must be sent if an SMSC member is unable to attend.
- The meeting agenda will be distributed at least one week prior to the meeting.
- All meeting minutes and action items will be documented and distributed with two weeks of the meeting.
- Action items will be tracked to closure.

Management Steering Group Charter (MSG)

Purpose

This Charter establishes the Management Steering Group (MSG) for the LaRC Software Process Improvement (SPI) Initiative.

The purpose of the MSG is to guide the SPI implementation activities at LaRC. The MSG will work with the SEPG to document and approve the LaRC SPI Initiative Implementation Plan and facilitate the achievement of the plan's goals and activities. The MSG sets the direction and priorities for the SPI initiative and also applies improvement activities to the existing management processes.

The MSG will also serve to resolve issues that arise during the SPI initiative that cannot be handled by the SEPG and Technical Working Groups (TWGs). The MSG removes barriers to the SPI initiative and creates a recognition and reward structure to recognize the efforts of the people involved in accomplishing the process improvement.

Scope

The MSG is made up of a small subset of the LaRC division chiefs whose organizations are involved in software management, development, maintenance, or assurance. This subset of division chiefs work together to address the software process improvement interests of the entire center. The MSG will exist for the duration of the SPI Initiative.

Mission

To support the operation of the SEPG and the execution of the approved implementation plan for software process improvement across LaRC.

Management Steering Group Responsibilities

- Approve Implementation Plan for SPI and significant changes to the plan
- Ensure alignment of SPI improvement activities with LaRC mission and goals
- Provide advocacy, pro-active commitment, and visible management support
- Allocate resources (which includes obtaining resources for Technical Working Groups (TWGs))
- Approve TWG and SEPG recommendations and support the implementation of approved recommendations
- Monitor the progress of the SPI Initiative
- Determine measurements to evaluate the initiative progress
- Provide guidance and direction to the SEPG
- Conduct periodic meetings with the SEPG to review the SPI Initiative and discuss concerns
- Promote cooperation and cross-functional communications
- Obtain and sustain LaRC support for the SPI Initiative
- Assist SEPG in risk mitigation for SPI Initiative
- Identify and solicit applicable organizations for adoption of results from successful pilots, and approve SEPG support and resources for those adoption activities
- Report progress to the Senior Management Steering Committee and Sponsors on a regular basis
- Address problems that are beyond the ability of the SEPG to effect.

Management Steering Group (MSG) Lead Responsibilities

- Leads MSG
- Schedules and chairs monthly MSG status meetings
- Tracks MSG action items
- Solicits support and active participation in the SPI Initiative

Software Engineering Process Group (SEPG) Lead Responsibilities

- Record MSG meeting minutes and action items
- Assure minutes and action items from each meeting are provided to the MSG

- Post MSG meeting minutes summary on web

Membership

Robert A. Kudlinski- Lead

Jerry N. Hefner

H. Milton Holt

Leonard R. McMaster

Doreen O. Neil

James R. Rooker

James C. Yu

Associate Membership

SEPG Lead, Pat Schuler

Conduct of Operations

- The MSG meets monthly.
- The SEPG leader is the facilitator for the MSG meetings.
- The meetings are mandatory for all MSG members. Designees must be sent if an MSG member is unable to attend.
- Meetings will have an agenda distributed at least three days prior to the meeting and all previous meeting minutes and action items will be documented and distributed no later than the agenda.
- Action items will be tracked to closure.
- MSG Lead rotates on a yearly basis.

Software Engineering Process Group Charter

Purpose

This Charter establishes the Software Engineering Process Group (SEPG) for the LaRC Software Process Improvement (SPI) Initiative.

The purpose of the SEPG is to provide the focal point for the organizations SPI Initiative and maintain an organizational awareness of the overall effort. The group is responsible for developing the LaRC SPI Initiative, Implementation Plan. The SEPG also serves as a facilitator to insure the successful completion of the goals and improvement activities documented in the plan, such as process and software technology improvements.

Facilitate Software Process Improvement Throughout the Organization

The SEPG maintains the motivation and enthusiasm for software process improvement at LaRC. The Group will champion the SPI Initiative throughout the organization. The SEPG, with the help of the Management Steering Group (MSG), will obtain and maintain management support for the initiative at all levels and across all domains at the center.

The SEPG will facilitate software process baselines and with the organization's management, will develop an Implementation Plan for the LaRC SPI Initiative,. The baselines will provide a foundation that defines existing capabilities and against which improvement can be planned.

Provide Process Consultation

The SEPG supports the line managers and development projects by providing process consultation when requested. It also works closely with the line managers and projects to provide guidance and support when improvement activities are being introduced. It can assist the line organizations in evaluation of new software technology and can also help plan for the introduction and transition to new technologies.

Track and Report SPI Progress

The SEPG monitors all the SPI activities and reports their status to the MSG. The SEPG will establish and maintain a Software Engineering Exchange web site for retaining the various artifacts that result from the improvement activities.

Serve as Focal Point for Organizational Learning

The SEPG will serve as a focal point of the SPI efforts by facilitating training in software process improvement and providing education in subjects related to the plan. From the Software Engineering Exchange web site, the SEPG will maintain and disseminate lessons learned and other results from the SPI Initiative.

Scope

The SEPG is comprised of software practitioner representatives from LaRC organizations involved in software management, development, maintenance, or assurance. These practitioners work together to address the software process improvement interests of the entire center. The SEPG will exist for the duration of the SPI Initiative.

Mission

- To manage the LaRC software process improvement initiative.
- To organize and initiate the prioritized actions in the approved LaRC SPI Initiative, Implementation Plan and to work toward achievement of the plans goals.
- To facilitate and monitor the development and implementation of process improvements throughout the center.
- To serve as a focal point for learning.
- To create an atmosphere to foster change.

Software Engineering Process Group Responsibilities

- Define and manage the plan for development and implementation of software process improvements across LaRC
- Define a LaRC software engineering ISO process
- Build and reinforce management support for the SPI Initiative
- Provide a resource pool for software engineering expertise and corporate knowledge
- Provide consultation and guidance on appropriate level of software engineering implementation and future directions
- Provide and facilitate education on software engineering to management and staff via workshops, seminars, symposia; set up news/user groups; and maintain web site
- Provide a repository for reuse code, documents, tool recommendations, procedures, processes, LaRC best practices, templates, lessons learned, metrics, and examples via the Software Engineering Exchange web site
- Facilitate sharing of tools and COTS maintenance costs across projects
- Estimate Technical Working Group (TWG) resources needed for improvement activities and recommend TWG members
- Designate a SEPG member to guide each improvement activity as described in the SPI plan (Section 9.2) and to facilitate the TWG meetings
- Monitor progress and review periodic TWG reports from designated SEPG member
- Review schedule and deliverables of the TWGs
- Approve the pilot project for each TWG
- Develop, coordinate, and integrate SEPG and TWG developed artifacts into a LaRC Software Engineering ISO Process
- Solicit and incorporate feedback on overall SPI Initiative and document lessons learned
- Leverage SEPG experiences and lessons learned across LaRC

Software Engineering Process Group (MSG) Lead Responsibilities

- Coordinates the day-to-day SEPG activities
- Acts as liaison between MSG and SEPG and reports monthly on SPI Initiative status, risks and accomplishments
- Ensures alignment with ISO-9000 Project
- Advises MSG of potential risks and recommended mitigation actions
- Manages allocation of resources to TWGs
- Tracks the number of projects implementing each improvement
- Facilitates MSG meetings

Membership

Pat Schuler, IOG/ISSD - Lead

Norma Campbell, RTG/FDCD

Jim Townsend, RTG/FMAD

Chuck Niles, IOG/FSED

Mike Chapman, IOG/ETTD

Pamela Rinsland, IOG/AESD

Jim Watson, OSEMA/OMA

Victoria Chung, IOG/SFSD

Floyd Shipman, RTG /FETD

Conduct of Operations

- The SEPG will report to and receive guidance from the MSG.
- The SEPG will hold regular meetings as required to accomplish the activities and goals of the SPI plan.
- The SEPG will keep LaRC informed of the SPI progress via the Software Engineering Exchange web page.
- The SEPG will facilitate Technical Working Groups (TWG)s.

- The SEPG will present periodic status reviews and briefings to the Management Steering Group (MSG).
- The SEPG Lead will be an associate member of the MSG.

Expected Products

- Documented processes and procedures on the execution of the LaRC software processes
- Status review briefings to MSG
- TWG Status Reports
- Software Engineering Exchange web site which will house SPI products (e.g. pilot reports and examples)
- Presentations to LaRC workforce on process improvement
- LaRC software baseline briefings